Biological Conservation 179 (2014) 17-22

Contents lists available at ScienceDirect

# **Biological Conservation**

journal homepage: www.elsevier.com/locate/biocon

# Short communication

# Emergence of Mong La on the Myanmar–China border as a global hub for the international trade in ivory and elephant parts

# Vincent Nijman\*, Chris R. Shepherd

Oxford Wildlife Trade Research Group, Oxford Brookes University, Oxford, UK TRAFFIC, Petaling Jaya, Malaysia

## ARTICLE INFO

Article history: Received 10 June 2014 Received in revised form 11 August 2014 Accepted 17 August 2014

Keywords: Burma China CITES Conservation Elephas maximus Myanmar Wildlife trade

#### ABSTRACT

We report on the illegal trade in ivory and elephant parts in the Special Development Zone of Mong La, Shan State, Myanmar, on the border with China. Mong La caters exclusively for the Chinese market and is best described as a Chinese enclave in Myanmar. We surveyed the morning market, shops and hotels in February 2006, February 2009 and December 2013-January 2014. Trade in body parts primarily concerned dried elephant skin (4 pieces in 2006, 278 in 2009 and 1238 in 2013-2014), and to a lesser extent molars and bones. We found 3494 pieces of carved ivory (none in 2006, 200 in 2009 and 3294 in 2013-2014) and 49 whole tusks (all in 2013-2014) openly for sale, suggesting Mong La has recently emerged as a significant hub of the ivory trade. The origin of the ivory may constitute a combination of Asian elephant ivory from Myanmar and African ivory imported via China. According to local sources the carving was done by Chinese craftsmen, in Mong La as well as across the border in China, and was largely, if not exclusively, intended for the internal Chinese market. Based on asking prices of the most commonly offered items the retail value of the ivory on display in Mong La during the 2013-2014 survey totals an estimated US\$1.2 million. Trade in elephant parts and elephant ivory is illegal in Myanmar and CITES I listing of elephants preclude international trade in them. Mong La is governed largely autonomously by an overlord and policed by an Eastern Shan State army. We urge both the Myanmar and Chinese governments to liaise with the Mong La rulers to curb the trade in ivory (and other high profile species), and recommend that the Myanmar and Chinese CITES authorities come together urgently as to resolve the illicit trade of ivory and elephant parts across their borders.

© 2014 Elsevier Ltd. All rights reserved.

# 1. Introduction

Trade in ivory is seen as a major impediment to elephant conservation, both for the Asian and African elephants alike (Choudhury et al., 2008; Wasser et al., 2010; Blanc et al., 2011; Vira and Ewing, 2014; Doak, 2014). Several Asian countries, in particular China and Thailand, have been identified as major importers and users of ivory (Milliken et al., 2013; Underwood et al., 2013). In 2007 China was granted permission to import 62 metric tonnes of African elephant ivory to be traded by government-approved ivory processing and retail outlets only. However, in recent years China has been implicated in the import of illegally sourced ivory from Africa and Asia (Wittemyer et al., 2011; Milliken et al., 2013) and about two-thirds of the ivory sold in shops in southern China lacked the required documentation (Martin and Vigne, 2011). In addition, neighbouring countries including Vietnam and Laos have been shown to act as gateways of ivory into China (Stiles, 2008; Nijman and Shepherd, 2012a).

Sharing a large border with China, with significant populations of wild and domestic Asian elephants *Elephas maximus*, and having strong economic ties to China and high levels of corruption, Myanmar is a potential gateway of illegal ivory into China (cf. Shepherd, 2002; Martin and Stiles, 2002; Vigne and Martin, 2002; Stiles, 2004; Felbab-Brown, 2011). We focussed on the town of Mong La, in the easternmost part of the country on the border with China, and a known centre for wildlife trade (Davies, 2005; Peterson, 2007; Shepherd and Nijman, 2007; Oswell, 2010; Felbab-Brown, 2011), to assess the trade in ivory and other elephant parts.

Mong La is situated in one of 24 Special Development Zones ('Special Region 4'), designated in 2001 as part of an overall plan to reduce poverty, raise the standard of living, and narrow the gap between urban and rural areas (ADB, 2006). The main road through Mong La is part of the R3B route linking Kunming (~700 km northeast of Mong La) to Bangkok (~1100 km south of Mong La) and forms part of the North–South Economic Corridor







<sup>\*</sup> Corresponding author at: Oxford Wildlife Trade Research Group, Oxford Brookes University, Oxford, UK.

(Tsuneishi, 2009). Mong La is strategically situated across the border from Dalou in the Chinese Province of Yunnan and is about 100 km from the town of Xishuangbanna (2010 population ~1.1 million) that is served by an international airport. From there are daily flights to the major ivory trading centre of Kunming (2011 population ~6.5 million) and other major towns in China, as well as international flights to the known ivory trading towns of Vientiane (2014 population ~800,000) in Laos and Bangkok (2010 population ~ 8.3 million) in Thailand (Nijman and Shepherd, 2012a; Doak, 2014). On the Myanmar side Mong La is an 80 km drive from Kentung, with its airport having flights to four major towns in Myanmar, including Tachilek on the border with Thailand and a known centre for ivory trade (Shepherd and Nijman, 2008).

Special Region 4 is controlled by the overlord Sai Leung (aka Sai Lin; Chinese name Lin Min Xiang) and policed by the 3000 strong National Democratic Alliance Army of the Eastern Shan State who enforce their own set of laws (Oswell, 2010): the Myanmar central government have limited authority in Mong La. Mong La's position on the border with China's Yunnan Province allows for cross-border trade with China. Starting in June 1989, when Special Region 4 was granted virtual autonomy, the town was developed by Chinese investors and focuses on the entertainment industry, with numerous nightclubs, brothels, exotic meat restaurants and 24-h casinos (Davies, 2005). The surrounding countryside has seen an increase in vegetable and cash crop production as to supply the Chinese market. While Mong La is situated within Myanmar its outlook is firmly directed to China. About 80% of the people working and living in the area are Chinese. Chinese (Mandarin/Putonghua) is spoken widely in Mong La, all signs are in Chinese characters, the mobile phone network and electricity providers are Chinese, and the Chinese Yuan Renminbi, and not the Myanmar Kyat, is the currency of daily use. Local time follows Beijing Standard Time and is 1.5 h ahead of the rest of Myanmar.

Asian elephants are a totally protected animal under Myanmar's Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law of 1994. Killing, possessing, selling, transporting or transferring protected wildlife, or any part thereof, without permission, is punishable with imprisonment for up to seven years and/or a fine of up to Kyat 50,000 (\$8183). Despite this, at least up until 2007, the government's Myanmar Timber Enterprise that manages several thousand domestic elephants used in the timber industry, auctions ivory, most likely sawn-off tips and tusks of elephants that have died of natural causes, locally with permission of the Ministry of Forestry (now Ministry of Environmental Conservation and Forestry) (Shepherd and Nijman, 2008). It is unclear if this practise continues. In China, Asian elephants are listed as a Class I Protected Wildlife Species under the Wildlife Protection Law; no trade in the species or its parts is allowed, and violation of this is considered a criminal offence. Asian elephants are listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) precluding all international commercial trade in the species, part thereof or in elephant ivory. Likewise African elephants Loxodonta africana (and including Loxodonta cyclotis) are listed on Appendix I, apart from populations from southern Africa that are listed on Appendix II, regulating trade. China became a signatory to CITES in 1981 and Myanmar in 1997.

### 2. Methods

We visited Mong La on three occasions, 6–7 February 2006 (VN and CSR plus obligatory guide from Mong La), 26–28 February 2009 (CSR with Adam Oswell plus an obligatory guide from Tachilek District) and on 31 December 2013 and 1 and 2 January 2014 (VN and CSR plus guide from Tachilek District). We surveyed the

wildlife morning market in the centre of town, gem and jewellery shops, mobile phone shops, specialised wildlife shops selling trophies and skins, restaurants and luxury hotels. Mong La zoo was visited in both in 2009 and 2014, noting that during the latter visit, according to our guide, the zoo was officially closed. With help from our guides we held conversations with vendors about the origin of the ivory, clientele, place of carving, trade routes and how this was linked to cross-border trade.

Elephant parts (skin, molars, etc.) were easily identifiable, and based on conversations with vendors we consider it highly likely that these all originate from Asian elephants. Ivory parts were checked regularly to verify that they were genuine elephant ivory and over the course of the survey we only encountered some 75 items of fake ivory, all displayed in the lower-end price shops. In 2013–2014 one shop displayed 5 carved hippopotamus Hippopotamus amphibius canines and we did not find any mammoth Mam*muthus* spp. ivory for sale. Photos were taken opportunistically. particularly in the open market, but many of the specialized shops did not allow photos to be taken. In 2013-2014 we requested prices of the most common ivory items (>50 items observed) in five shops (given in Yuan, here converted to US\$ at an exchange rate of 6.10 Yuan to the dollar); no prices were requested for elephant parts or whole tusks as we, two Caucasian males, are unlikely to be genuine buyers. We estimated the retail value of the ivory openly for sale, excluding the rarer carvings, by multiplying the number of items observed by the average asking price. For whole tusks (raw and polished) we conservatively used a value of \$2500 per tusk based on prices reported by Stiles (2008), Stiles et al. (2011) and Martin and Vigne (2011).

#### 3. Results

#### 3.1. Trade in elephant parts

Asian elephant skin pieces were widely and increasingly available (2 shops and stalls in 2006, 14 in 2009, 10 in 2013-2014). All we observed an estimated 1470 pieces in various shops (25 in 2009, 1050 in 2013-2014) and the morning market (4 pieces in 2006, 203 in 2009 and 188 in 2013-2014). Apart from an estimated 100 pieces that were soaked in alcohol in 2013-2014, elephant skin was sold dried (Fig. 1). In size they averaged about  $10\times10~\text{cm}$  to  $12\times12~\text{cm},$  ranging from  $5\times5~\text{cm}$  to  $30\times30~\text{cm}.$ All parts of the skin were used including for instance parts of the tail and the trunk, but we did not observe any ear pieces. Most pieces were displayed individually, laid out on mats or in display cases, but in 2013-2014 one shop had two large boxes with skin pieces, conservatively estimated at 500 and 250 pieces each. Other than skins we observed only small amounts of other elephant parts; these included two molars, a trunk tip, and five rings made out of elephant's tail tip hair.

In the Mong La zoo a single adult female was observed both in 2009 and 2014. According to our guide at one time 10 elephants were present but two died and the remaining 7 were sent to one or more elephant tourism camps in Thailand. In 2009 the zoo shop had some 200 pieces of ivory for sale and 25 pieces of elephant skin. In 2014 the shop carried 22 pieces of ivory, including a tusk tip, two molars and the skull of an immature elephant. A nearby shed housed a near complete skeleton of another elephant. Both skulls lacked tusks.

### 3.2. Ivory trade

In 2006 no ivory was observed. Apart from the 200 pieces of ivory observed in the Mong La zoo shop in 2009 we did not observed any ivory for sale in the town. In 2013–2014 we observed 3294 pieces of carved ivory and 49 whole (raw and polished) tusks



**Fig. 1.** Ivory and elephants parts for sale in Mong La, Myanmar, 31 December 2013–2 January 2014, showing (clockwise from top-left) (a) whole tusks, (b) display case stuffed with ivory, (c) bangles on the counter, (d) large pieces of elephant skin next to Asiatic black bear paws, (e) tusks and large figurine carvings on display and (f) elephant skin pieces for sale at the morning market.

in 27 shops (Table 1). Only two tusk tips were observed, one in a shop in and another close to the Mong La zoo and were said to be from zoo elephants. The most common items were pendants, bangles, necklaces and figurines. The pedants were generally large (often measuring  $6 \times 4$  cm or larger) but most other carvings were relatively small. We observed few carved whole tusks ('bridges')

but no large figurines (>50 cm) or intricately carved screens or lampshades. The carving was of good quality but not spectacular and many items (bangles, necklaces, seals, chopsticks) did not require a high level of craftsmanship.

Spatially the trade in ivory was largely separated from the trade in elephant parts, with the trade in skin pieces taking place almost

#### Table 1

Volumes of ivory observed in Mong La, Myanmar, 31 December 2013–2 January 2014, with asking prices (in US\$) for the most commonly observed items, with inflation corrected average prices for Guangzhou and Fuzhou, China (Martin and Vigne, 2011), Ho Chi Min City and Ha Noi, Vietnam (Stiles, 2009).

Item	Number (2013–2014)	Asking prices (USD)					
		2014 Mong La	2011 Guangzhou	2011 Fuzhou	2008 Ho Chi Min City	2008 Ha Noi	
Pendants	1422	273	68	137	171	-	
Necklace	439	180	466	77	271	198	
Bangles	591	579	876	574	406	394	
Chop sticks (pairs)	67	279	471	-	130	92	
Cigarette pipes	215	199	307	414	384	189	
Seal (yìn jiàn/hanko)	142	279	222	88	299	92	
Figurines (8–15 cm)	208	377	1292	1682	541	812	
Figurines (16-30 cm)	122	820	9719	9564	974	974	
Earrings (pairs)	68						
Rings	12						
Fan	3						
Bridge	5						
Polished whole tusk	6						
Raw tusk	43						
Tusk tip	2						
Flakes (200 ml bag)	1						

exclusively in the central market and the ivory trade in specialised shops. Only some general wildlife shops offer both skin pieces and ivory for sale. Tusks were mostly sold in general wildlife shops, although some of them were on display in specialised ivory shops.

While most shops displayed less than 100 pieces of ivory, often far less, in several shops large display cases were present suggesting ivory was an important commodity. The largest number of items observed in a single shop was 663. None of the luxury hotels displayed ivory but small amounts were for sale in mobile phone shops and electronic equipment outlets. All items were displayed openly, including all whole tusks.

## 3.3. Origin, clientele and monetary value

As outlined in the introduction Mong La caters for the Chinese, and indeed all the evidence, including information from vendors, suggests the ivory in Mong La is destined for the internal Chinese market. While there is an official border crossing on the main road from Mong La into Dalou there are numerous other non-controlled roads and tracks linking the two countries to such an extent that the border can be described as porous at best. All shopkeepers in Mong La were Chinese and all clientele we observed in the markets appeared to be Chinese. According to the vendors the main clientele were indeed Chinese. Carving was done by Chinese craftsmen. One vendor indicated this was done in the Mong La area but three others informed us that carving was done across the border in China. One shop displayed pendants with Chinese 'governmentissued registration cards' carrying a photo of the ivory item for sale. Unfortunately no photos could be taken in this shop therefore we lack detail on these cards (and in fact they may not be genuine). The system of registration cards is an obligatory requirement for the sale of African ivory in China but not Myanmar, again suggesting links with the internal Chinese markets. The origin of the ivory was unclear, with two vendors unequivocally stating it originated from Myanmar and four pointing across the border to China, in which case it comprises a combination of Asian and African ivory. While the majority of the 60+ species of wildlife we observed for sale in Mong La during our surveys occur in Myanmar, the presence of 5 carved hippo teeth for sale in one shop and African rhino horn in another, may be indicative of a trade link to Africa, either directly or via China. Furthermore, we observed parts of species that were not native to Myanmar but that do occur in China, such as Himalayan blue sheep Pseudois nayaur and Tibetan antelope Pantholops hodgsonii, again suggesting trade links with China.

Prices of carved ivory ranged from \$155 for a cigarette pipe or \$164 for a thin necklace to \$820 for a 3.5-cm thick carved bangle or a 30 cm tall figurine. Fake ivory made of resin or plastic was significantly less expensive than real ivory, with for instance the asking price of a 1.5 and 2.0 cm wide fake ivory bangle being \$41 and \$57 against a some \$279 and \$377 for a genuine similar sized one.

A back-of-an-envelope calculation of the retail value of the ivory for sale based on the average price the most commonly observed carvings (Table 1) arrives at a value of \$1.10 million. Add-ing the 49 raw and polished tusks at an average value of \$2500 for a medium-sized specimen suggests a total retail value of \$1.22 million.

#### 4. Discussion

### 4.1. Volumes of trade in a comparative context

The illegal trade of elephant ivory and elephant parts flourishes in Mong La, perhaps in part as a reflection of the limited efforts made by both the international community and local authorities to address problems in law enforcement and compliance with existing laws and CITES regulations. The increase in ivory trade we observed over the course of our study in Mong La fits in well with the overall pattern observed globally (Underwood et al., 2013; Milliken et al., 2013). More or less coinciding with the start of our study in 2006, global ivory transactions have increased year upon year. This is particularly apparent in transactions involving large quantities of raw ivory over 100 kg and transactions of carved ivory less than 100 kg. The former points to a significant increase in raw ivory supply as measured by the frequency of raw ivory trade activity in this weight category, which in 2011 was at a level almost three times what it was in 1998, whereas the increase of carved ivory transactions in the smaller weight classes also indicates growth in end-use ivory market demand (Milliken et al., 2013). The pattern that more worked ivory trade activity is transpiring because more people in more locales are consuming carved ivory has been observed in a number of key markets in Asia (Guangzhou, China: Martin and Vigne, 2011: Vientiane, Laos: Nijman and Shepherd, 2012a,b; Bangkok, Thailand: Doak, 2014); from our observations it seems that Mong La fits this pattern. It is also worth noting that Underwood et al. (2013: p. 9) reported a marked increase in the role of Southeast Asian countries in the global ivory trade in recent years, especially in transactions involving raw ivory over 100 kg and transactions of carved ivory less between 10 and 100 kg; again our observations in Mong La fit this pattern.

This is the first quantitative report of a significant trade in dried elephant skin in Asia. All the evidence suggests that these skins are derived from Asian elephants in Myanmar (very few elephants remain in China (Choudhury et al., 2008) and African elephant skin is not known to be traded into Asia) to be used either locally in Mong La or, more likely, to enter the Chinese market. During 2006 surveys of the traditional medicinal markets of Kyaik-tiyo and Tuang Gyi, in interior Myanmar, we found small amounts of elephant skin (i.e. 23 and 3 pieces, respectively) (Shepherd and Nijman, 2008) at a very different scale than observed in Mong La. Santiapillai (1997) stated that there were reports of elephants being illegally killed for their hides in Myanmar, which were apparently smuggled to China, but his account lacks details. These reports in all likelihood do not refer to complete hides but instead to pieces of skin as observed in Mong La (象皮 [Xiang Pi] is translated to English as elephant skin or elephant hide). In 1996, Guo et al. (1997) found 2–3 kg of elephant skin pieces for in the town of Xi'an in China's Shaanxi province, and in 1997 Li and Wang (1999) recorded an unspecified amount of elephant skin in Yunnan province (cities of Kunming, Mengzi, Hekou, Dulong). Similarly, O'Connell-Rodwell and Parry-Jones (2002) report the sale of unspecified amount of elephant skin in 2001 in Yunnan (cities of Xishuangbanna, Wading, Zhangfeng, Yingjiang). In 1999 Nooren and Claridge (2001) recorded 3 small pieces of elephant skin in Vientiane, Laos, and in 2011 we recorded small amounts of elephant skin in the Laos-China border town of Boten (VN and CRS, unpublished data), and the medicinal markets in Vientiane (Nijman and Shepherd, 2012b).

In addition to market surveys, Guo et al. (1997) analysed questionnaires from 13 traditional Chinese medicine manufacturers. They tabulated the average annual consumption of elephant skin for the period 1990–1995 at 45,000. Unfortunately, no unit was given for this entry, but all but one of the other 32 entries were given in kg or in pieces. Whichever it is, kg or pieces, this represents a considerable amount of elephant skin (taking an average of 50 g for a piece this equates to 2250 kg or the equivalent of some 39 dead elephants). Furthermore, Guo et al. (1997) state that their data "only reflects the annual average consumption of wildlife items by 13 of the 104 key TCM manufacturers, and there are as many as 1000 TCM manufacturers in China". This same scale of trade in elephant skins becomes apparent when examining seizure data (Table 2). Nooren and Claridge (2001) and O'Connell-Rodwell and Parry-Jones (2002) document two seizures of elephant skin in Yunnan and Guangzhou, reported to be equivalent to 20 and 260 elephants, respectively, with the smaller seizure originating from Myanmar. More recent seizures are reported from Baoshan and Dehong Dai, both bordering Myanmar, with the latter shipment originating from Myanmar, as well as from Phyue in Myanmar. Combined these five seizures represent over 300 dead elephants, with a significant proportion of them originating from Myanmar.

The trade in dried elephant skin is probably largely a by-product of the illegal killing of elephants for their ivory and/or meat, or as a consequence of human–elephant conflict within Myanmar. However, the open availability of this easily recognisable part of a totally protected species with apparent impunity may indicative of the lack of law enforcement in Mong La.

Law enforcement with respect to ivory appears to be completely absent in Mong La: in the 23 years that the Elephant Trade Information System (ETIS) database, which TRAFFIC manages on behalf of the CITES Conference of the Parties, has been operational, Myanmar is one of only 10 elephant range countries that never submitted any data on confiscations for inclusion in the analysis. As such, on a global scale, Myanmar does not feature prominently in the international ivory trade. In contrast, China consistently is identified in the ETIS analysis as the main destination for ivory in Asia (Milliken et al., 2013).

The open sale of elephant ivory and elephant products as observed in the present study places Mong La firmly in the top of Southeast Asian cities in terms of volume and availability, especially when considering the volumes observed in 2013–2014 (3 294 items in 27 shops). In fact, based on post-2008 surveys, only in Bangkok and Phayuha Kiri in Thailand (13,237 items in 120 shops: Doak, 2014; 4 455 items in 8 shops: Stiles, 2009) and Guangzhou in China (6 437 items in 80 shops: Martin and Vigne, 2011) have larger volumes been observed. However, it seems that raw tusk were far less available in these towns than in Mong La.

## 4.2. A recent emergence of ivory trade and it economic value

We did not observe any ivory for sale in 2006 and only small amounts in 2009. Given the prominence of the ivory shops in 2013–2014 it is highly unlikely that we would have missed significant quantities of ivory during the first two surveys. Indeed Davies (2005), based on a trip to Mong La in 2003, reported trade in a wide range of species yet does not mention trade in ivory once. The same is true for Felbab-Brown (2011) who visited Mong La in 2005 and 2006, and Peterson (2007) who visited Mong La in 2006. Interestingly, despite gaining popularity in the ivory markets of China no mammoth ivory was observed nor did we observe intricate large ivory carvings. The reasons for this are unclear but may suggest that while Mong La has links to certain ivory trade centres in China, this may not include skilled carving centres or cities where mammoth ivory is regularly traded.

Prices of ivory observed in Mong La are very much in line what has been observed recently in southern China (Martin and Vigne, 2011) and Vietnam (where Ho Chi Min City and Hanoi cater both for the internal and Chinese market: Stiles, 2008) (Table 1). Pendants were considerably more expensive than in Vietnam and China, but not when their larger than average size is taken into account, and other differences are best explained by size differences and the intricacy of the carving. When comparing inflation corrected prices of 1.0 cm bangles (these being more or less identical throughout Asia), it becomes clear that asking prices in Mong La (average \$303) are more in line with that in Guangzhou, China (\$433: Martin and Vigne, 2011) and Vientiane, Laos (\$352, VN and CRS, unpublished data 2011), with the Vientiane ivory trade being strongly tied to China (Nijman and Shepherd, 2012a), than for instance Tachilek, Myanmar (\$82, VN and CRS, unpublished data 2013), Bangkok (\$144), Phayuha Kiri (\$50) (Stiles, 2009), Ho Chi Min City (\$140) or Ha Noi (\$228) (Stiles, 2008). In fact, taking Guangzhou as a centre of Asian ivory trade there is a significant negative correlation between the average asking prices for these bangles and the distance to Guangzhou (Spearman Rank Correlation Coefficient, r = -0.76, n = 7, P = 0.04).

The combined retail value of the ivory in Mong La was estimated at over \$ 1 million, making the sale of ivory an important economic contribution to the local economy, and certainly to those in control of the flow of ivory. We have no data on who benefits from this but any solution to curb the illegal trade in, from and through Mong La has to take these individuals and organisations into account.

#### 4.3. International aspects and how to curb the trade

While all observations were made on the Myanmar side of the international border it is clear that the trade in ivory and elephant parts involves considerable cross-border transactions. By all accounts Mong La is best considered a Chinese enclave in Myanmar, using Beijing time, paying in Yuan and speaking Chinese, with a strong outlook towards China. In fact, approaching Mong La from the Myanmar side it feels as if one enters the town through the backdoor over a little used double-tracked road. Just like many aspects of daily live in Mong La, the different aspects of the ivory trade (sourcing, carving, selling and buying) occurred across the Myanmar–China border.

Based on our study it appears that at least part of the ivory originates from Myanmar and enters China after purchase by Chinese customers. A larger amount of ivory (both raw and carved) enters Myanmar from China, only to re-enter China after being purchased by Chinese clientele in Mong La. We lack the data to trace the origin of this ivory (e.g. through DNA or isotope analyses: Wasser et al., 2004; Gupta et al., 2006; Singh et al., 2006), but given the large amount of African ivory for sale in China (Martin and Vigne, 2011) it is likely that at least part of the ivory is derived from African elephants. Indeed the observation of Chinese registration cards, when genuine exclusively used for African ivory for sale in accredited Chinese shops, in Mong La, is indicative of African ivory having entered Myanmar.

Milliken et al. (2013, p. 14) noted that "over the last three years, in terms of frequency and scale, the Chinese market has been more heavily implicated in illicit trade in ivory than any other country.

Table 2

Significant seizures of elephant skin in southern China and Myanmar. The Guangdong seizure reported both weight and number of individuals; using the same conversion rate of 58 kg of skin per individual elephant the missing values are reported in brackets.

Location, date	Elephants (minimum)	Weight (kg)	Source
Kunming, Yunnan, China, September 2000	20	[1160]	Nooren and Claridge (2001)
Guangdong, Guangzhou, China, November 2001	260	15,000	O'Connell-Rodwell and Parry-Jones (2002)
Baoshan, Yunnan, China, June 2008	[13]	734	TRAFFIC (2008)
Phyue, Bako, Myanmar, November 2013	[1]	50	Anonymous (2013)
Dehong Dai, Yunnan, China, March 2014	[8]	421	Anonymous (2014)

Whilst hundreds of small ivory seizures are regularly occurring, large-scale ivory seizures are also a problematic issue [with] 83% of China's ivory trade since 2006 has occurred over the last three years. As an end-use consumer, this value strongly signals that the Chinese ivory market is more active than in any previous ETIS analysis". It is clear from the present study, as well as ones conducted in Laos and Vietnam (Stiles, 2008; Nijman and Shepherd, 2012a), and indeed the ETIS analysis (Milliken et al., 2013) that China's ivory trade is not geographically restricted to China. Increasingly ivory trade in neighbouring countries are China-oriented and controlled.

There are probably no easy solutions for curbing the trade in Mong La as multiple players are involved, each with their own agenda, reach and responsibilities. From a naive strictly legalistic viewpoint it is the central government in Myanmar that has the authority to deal with its internal ivory markets, including Mong La. They furthermore have the responsibility to prevent any ivory from leaving the country, whereas China has the moral and legal obligation not to allow it to enter its territory. In Mong La, however, for the last decades the central Myanmar government have little say in how it is ruled or governed. The overlord Sai Leung, aided by the National Democratic Alliance Army of the Eastern Shan State, and other local rulers may have a greater influence, but it is unlikely they can operate without the (implicit or explicit) approval of China. Enforcement efforts need to be stepped up considerably, ideally with the backing of the Myanmar and Chinese central governments. We recommend that the Myanmar and Chinese CITES authorities come liaise urgently - joined if possibly by the local Mong La rulers – as to resolve the illicit trade of ivory and elephant parts across their borders.

#### Acknowledgements

We thank our guides, who have to remain anonymous, for their guidance and Adam Oswell help during the 2009 survey. Tom Milliken and two reviewers provided helpful suggestions for improvement.

#### References

- ADB (Asian Development Bank), 2006. Asian Development Bank and Myanmar, Fact Sheet. <www.adb.org/Documents/Fact\_Sheets/MYA.asp> (viewed 09.06.09).
- Anonymous, 2013. Myanmar: Combating Illegal Wildlife Trafficking and Illegal Logging (October–November 2013). ASEAN-WEN, Bangkok.
- Anonymous, 2014. De Hong, Yunnan, Hunts Down Case of 421 kg of Elephant Skin Smuggling. <www.fuxiban.net/42811-1.html>.
- Blanc, J., Hedges, S., Milliken, T., Skinner, D., 2011. Status of elephant populations, levels of illegal killing and the trade in ivory: a report to the standing committee of CITES, SC61 Doc. 44.2 Annex 1. In: 61st Meeting of the CITES Standing Committee, Geneva, Switzerland.
- Choudhury, A., Lahiri Choudhury, D.K., Desai, A., Duckworth, J.W., Easa, P.S., Johnsingh, A.J.T., Fernando, P., Hedges, S., Gunawardena, M., Kurt, F., Karanth, U., Lister, A., Menon, V., Riddle, H., Rübel, A., Wikramanayake, E., 2008. *Elephas maximus*. IUCN Red List of Threatened Species. <www.iucnredlist.org> (downloaded 15.12.13).
- Davies, B., 2005. Black Market: Inside the Endangered Species Trade in Asia. Earth Aware Editions, San Rafael.
- Doak, N., 2014. Polishing off the Ivory Trade: Surveys of Thailand's Ivory Market. TRAFFIC International, Cambridge.

- Felbab-Brown, V., 2011. The Disappearing Act The Illicit Trade in Wildlife in Asia. Brookings Institution, Washington.
- Guo, Y., Zou, X., Chen, Y., Wang, D., Wang, S., 1997. Sustainability of Wildlife Use in Traditional Chinese Medicine. Endangered Species Scientific Commission, P.R.C., Beijing.
- Gupta, S.K., Thangaraj, K., Singh, L., 2006. A simple and inexpensive molecular method for sexing and identification of the forensic samples of elephant origin. J. For. Sci. 51, 805–807.
- Li, Ŵ., Wang, H., 1999. Wildlife trade in Yunnan Province, China, at the border with Vietnam. TRAFFIC Bull. 18, 21–30.
- Martin, E., Stiles, D., 2002. The Ivory Markets of South and South East Asia. Save the Elephants, London.
- Martin, E.B., Vigne, L., 2011. The Ivory Dynasty: A Report on the Soaring Demand for Elephant and Mammoth Ivory in Southern China. Elephant Family, The Aspinall Foundation and Columbus Zoo and Aquarium, London.
- Milliken, T., Burn, R.W., Underwood, F.M., Sangalakula, L., 2013. Elephants: Monitoring of Illegal Trade in Ivory and Other Elephant Specimens. CoP16 Doc. 53.2.2 (Rev. 1). CITES, Gland.
- Nijman, V., Shepherd, C.R., 2012a. The role of Lao PDR in the ivory trade. TRAFFIC Bull. 24, 35–40.
- Nijman, V., Shepherd, C.R., 2012b. China's role in ivory and elephant parts trade from Lao PDR. Oryx 46, 172–173.
- Nooren, H., Claridge, G., 2001. Wildlife Trade in Laos: The End of the Game. IUCN, Amsterdam.
- O'Connell-Rodwell, C., Parry-Jones, R., 2002. An Assessment of China's Management of Trade in Elephant and Elephant Products. TRAFFIC International, Cambridge.
- Oswell, A.H., 2010. The Big Cat Trade in Myanmar and Thailand. TRAFFIC Southeast Asia, Petaling Jaya.
- Peterson, D., 2007. Dark appetites. AsianGEOgraphic 6, 44–55.
- Santiapillai, C., 1997. The Asian elephant conservation: a global strategy. Gajah 18, 21–39.
- Shepherd, C.R., 2002. The Trade of Elephants and Elephant Products in Myanmar. TRAFFIC International, Cambridge.
- Shepherd, C.R., Nijman, V., 2007. An assessment of wildlife trade at Mong La market on the Myanmar-China border. TRAFFIC Bull. 21, 85–88.
- Shepherd, C.K., Nijman, V., 2008. Elephant and Ivory Trade in Myanmar. TRAFFIC Southeast Asia, Petaling Jaya.
- Singh, R.R., Goyal, S.P., Khanna, P.P., Mukherjee, P.K., Sukumar, R., 2006. Using morphometric and analytical techniques to characterize elephant ivory. For. Sci. Int. 162, 144–151.
- Stiles, D., 2004. Update on the ivory industry in Thailand, Myanmar and Viet Nam. TRAFFIC Bull. 20, 39–43.
- Stiles, D., 2008. An Assessment of the Illegal Ivory Trade in Viet Nam. TRAFFIC Southeast Asia, Petaling Java.
- Stiles, D., 2009. The Elephant and Ivory Trade in Thailand. TRAFFIC Southeast Asia, Petaling Jaya.
- Stiles, D., Martin, E., Vigne, L., 2011. Exaggerated ivory prices can be harmful to elephants. Swara (October-December), pp. 16–20.
- TRAFFIC, 2008. Huge Pangolin and Elephant Skin Seizure in China. <www. traffic.org/seizures-journal-legacy/2008/6/1/huge-pangolin-and-elephant-skinseizure-in-china.html>.
- Tsuneishi, T., 2009. Border Trade and Economic Zones on the North-South Economic Corridor: Focussing on the Connecting Points between 4 Countries. Institute of Developing Economies, Chiba, Japan.
- Underwood, F.M., Burn, R.W., Milliken, T., 2013. Dissecting the illegal ivory trade: an analysis of ivory seizures data. PLoS ONE 8, e76539.
- Vigne, L, Martin, E, 2002. Myanmar's ivory trade threatens wild elephants. Gajah 21, 85–86.
- Vira, V., Ewing, T., 2014. Ivory's Curse The Militarization and Professionalization of Poaching in Africa. Born Free and C4ads, Washington.
- Wasser, S.K., Shedlock, A.M., Comstock, K., Ostrander, E.A., Mutayoba, B., Stephens, M., 2004. Assigning African elephant DNA to geographic region of origin: applications to the ivory trade. Proc. Natl. Acad. Sci. USA 101, 14847–14852.
- Wasser, S., Poole, J., Lee, P., Lindsay, K., Dobson, A., Hart, J., Douglas-Hamilton, I., Wittemyer, G., Granli, B., Gunn, J., Alberts, S., Beyers, R., Chiyo, P., Croze, H., Estes, R., Gobush, K., Joram, P., Kikoto, A., Kingdon, J., King, L., MacDonald, D., Moss, C., Mutayobo, B., Njumbi, S., Omondi, P., Nowak, K., 2010. Elephants, ivory, and trade. Science 327, 1331–1332.
- Wittemyer, G., Daballen, D., Douglas-Hamilton, I., 2011. Poaching policy: rising ivory prices threaten elephants. Nature 476, 282–283.